

Work Order ID 149606

Monday, November 07, 2016 7:41:10 AM

149606

Page 1

Item ID: 646.9701

Revision ID:

Item Name: Cutter Sub Assembly

Start Date: 7/20/2016 Start Qty: 8.00

Required Date: 7/25/2016 Req'd Qty: 8.00

Reference:

Approvals:

Process Plan:

QC:

Date: NOV 07 2016

Date:

Tooling:

SPC (Y/N):

Date:

Date:

Run Start

Stop

NR1

NR2

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

646.9700

REV D2

110

Pick Kit

0.00

110

Packaging

Memo

0.00

Packaging

DAS
6
9-89

NOV 07 2016

120

0.00

120

Small Fab

Memo

0.08

Small Fab

Assemble as per dwg and apply loctite 598 on all faying surfaces per note.

A/R RTV LOCTITE 598: 135477
exp. date: 04/18

8X

DAS
36
9-89

130

QC5- Inspect part completeness to step on W/O

0.00

130

QC

Memo

0.01

Quality Control

8

DAS
38
9-89

NOV 16 2016

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐	AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐			
Date : _____	Step #: _____	QTY Effective : _____		MRB (QSI042) Approval	
Description Work Order Deviation		Disposition		Completed By	
				Lead hand / Supervisor Approval Verification	
				QC / QA Coordinator Approval	
Root Cause		FAULT CATEGORY			
Environment ☐ Design ☐ Doc/Data ☐ Equip/Tooling ☐ Handling/Pre ☐ Material ☐ Internal Transport ☐ Tribal Knowledge ☐ LOA ☐ Substation ☐ Past Expiry Date ☐ Misidentified ☐ No Re-verification ☐ Operator ☐ Offset/Setup ☐ Supplier ☐ Training ☐ Use for Testing ☐ Poor Information ☐ Rushing ☐ Product Improvement ☐ Process Improvement ☐ Manufacturing Process ☐ Past Due ☐	Pressure/Forced ☐ Bending ☐ Centre Not Concentric ☐ Cracks ☐ Crimp/Kink/Ripple/Wave ☐ Cuffs ☐ Crushing ☐ Heat Treat ☐ Wave/Twist in Tube ☐ Marks/Chatter ☐ Temperature/Cure ☐ Set-up ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Inspection Incomplete/Unqualified ☐ Contamination ☐ Countersink ☐ Cut Too Short ☐ Instructions Incomplete/Unclear ☐ Drill Holes ☐	Power Loss/Surge ☐ Folio/Program ☐ Grain ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set ☐ Mislabeled ☐ Fit/Function ☐ Misaligned/off center ☐ Positioned Wrong ☐ Outside Dimensions ☐ Over/Under tolerance ☐ Part Incorrect ☐ Part Lost/Missing ☐ Part Moved ☐ Drawing ☐ Finish ☐ Misread ☐ Turning Sequence ☐			
OTHER : _____					

Monday, November 07, 2016 7:41:10 AM

Page 2

DAS
21
9-39

DQA: _____ Date: _____

**WORK ORDER NON-CONFORMANCE / UPDATE**

QA Closed: _____ Date: _____

Work Order update only ☐

Work Order: _____ Part No. _____ NCR No. _____		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☐ Suspected Unapproved ☐		AGAINST DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Thermoforming ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☐ Composite ☐ Water Jet ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Supplier ☐ Engineering ☐ Quality ☐ Other ☐					
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Design ☐	☐	Operator ☐	☐	Bending ☐	☐	Set-up ☐	☐
Doc/Data ☐	☐	Offset/Setup ☐	☐	Centre Not Concentric ☐	☐	BOM/Route ☐	☐
Equip/Tooling ☐	☐	Supplier ☐	☐	Cracks ☐	☐	Broken/Damage/Defect ☐	☐
Handling/Pre ☐	☐	Training ☐	☐	Crimp/Kink/Ripple/Wave ☐	☐	Inspection Incomplete/Unqualified ☐	☐
Material ☐	☐	Use for Testing ☐	☐	Cuffs ☐	☐	Contamination ☐	☐
Internal Transport ☐	☐	Poor Information ☐	☐	Crushing ☐	☐	Countersink ☐	☐
Tribal Knowledge ☐	☐	Rushing ☐	☐	Heat Treat ☐	☐	Cut Too Short ☐	☐
LOA ☐	☐	Product Improvement ☐	☐	Wave/Twist in Tube ☐	☐	Instructions Incomplete/Unclear ☐	☐
Substation ☐	☐	Process Improvement ☐	☐	Marks/Chatter ☐	☐	Drill Holes ☐	☐
Past Expiry Date ☐	☐	Manufacturing Process ☐	☐	OTHER :			
Misidentified ☐	☐	Past Due ☐	☐				

Monday, November 07, 2016 7:41:16 AM

1 49606

646 9701

Required Date: 7/25/2016

Required Qty: 8.00

IPP REV

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
646.9710		Manufactured	No				Each	16.0000		8			
646 9710									**				
Body													
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				cck012				16					
				142487				6					
				147271				10					
													NOV 07 2016
646.9711		Manufactured	No			110	Each	68.0000	2	16			
646 9711									**				
Blade													
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				CCK106				28					
				147263				28					
				CCK108A				40					
				148546				10					
				150119				30					
MS27039-08-19		Purchased	No			110	Each	465.0000	6	48			
MS27039-08-19									**				
Screw													
				<u>Location</u>				<u>Loc Qty</u>		<u>Loc Code</u>			
				GA				182					
				m135948				182					
				ST277				283					
				m135566				83					
				m135865				100					
				m136042				100					

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

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Doc/Data ☐	☐	Offset/Setup ☐		☐	Centre Not Concentric	☐	BOM/Route
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LOA ☐	☐	Product Improvement ☐		☐	Wave/Twist in Tube	☐	Instructions Incomplete/Unclear
Substation ☐	☐	Process Improvement ☐		☐	Marks/Chatter	☐	Drill Holes
Past Expiry Date ☐	☐	Manufacturing Process ☐		OTHER : _____			
Misidentified ☐	☐	Past Due ☐					

Picklist Print

Monday, November 07, 2016 7:41:16 AM

Work Order ID: 149606

149606

Parent Item: 646.9701

646 9701

Parent Item Name: Cutter Sub Assembly

Start Date: 7/20/2016

Required Date: 7/25/2016

Start Qty: 8.00

Required Qty: 8.00

NAS1149FN832P

Purchased

No

110

Each

1,831.000

12

96

NAS1149FN832P

Washer

NOV 07 2016

DAS
6
9-89

Location

Loc Qty

Loc Code

GA

1389

M133769

89

M135058

1300

ST263

442

M135603

442

MS21042L08

Purchased

No

110

Each

1,226.000

6

48

MS21042L 08

Nut

NOV 07 2016

DAS
6
9-89

Location

Loc Qty

Loc Code

GA

50

m135274

50

ST303

1176

m135672

176

m135766

200

m135948

300

m135978

500

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

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Work Order update only ☐

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OTHER : _____																																																													



APICAL INDUSTRIES, INC.
dba DART AEROSPACE

TRANSACTION CODES (TC):
A-ADD C-CREATE
R-REVISE D-DELETE

ENGINEERING CHANGE NOTICE NO.

05360

SHEET 1 OF 1

DWG NO. 646.9700

REV: D

PREPARED BY J. BECKER

DATE: 03/24/16

EFFECT ON DWG
☐ INC. ☒ UNINC.

DWG TITLE: CUTTER SUB ASSY

APPROVED BY: ENGR *[Signature]*

MFG *[Signature]*

QC *[Signature]*

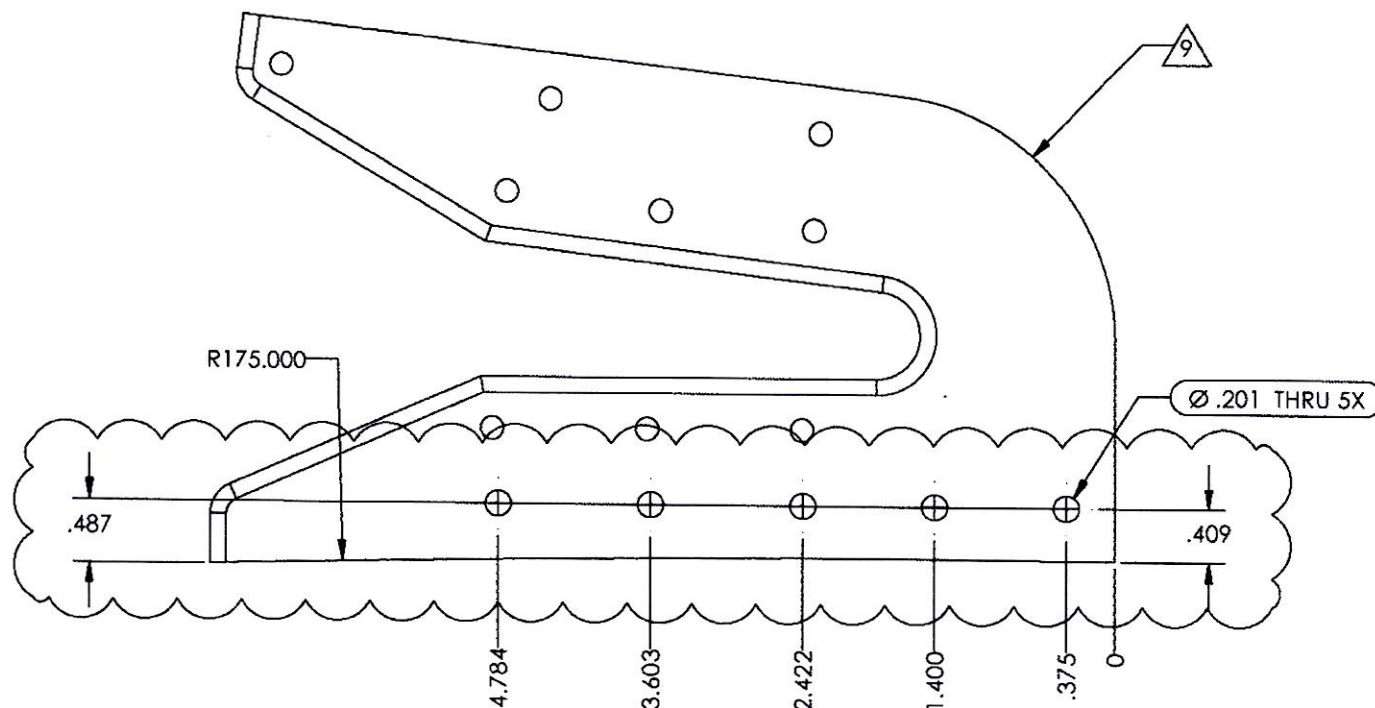
EFF. CURRENT ORDER

REASON: REVISED DIMENSIONS

ECR: N/A

ACTION ITEM:
1.

SHEET 7, ZONE C3 IS:



SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 149606 MJS
16-08-03

DOCUMENTS EFFECTED:

☐ PATTERN ☐ MDL ☐ INSTALL INSTRUCTIONS ☐ ICA ☐ FMS ☐ BOM

CHANGE CATEGORY

☐ MAJOR ☒ MINOR

DER REVIEW REQUIRED

☐ YES ☒ NO

DQA: _____ Date: _____



WORK ORDER NON-CONFORMANCE / UPDATE

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Date :		Step #:		QTY Effective :			MRB (QSI042) Approval 		
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Root Cause			FAULT CATEGORY							
Environment ☐	☐	No Re-verification	☐	Pressure/Forced	☐	Temperature/Cure	☐	Power Loss/Surge	☐	Positioned Wrong
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Past Expiry Date ☐	☐	Manufacturing Process	OTHER : _____							
Misidentified ☐	☐	Past Due								



APICAL INDUSTRIES, INC.
dba DART AEROSPACE

ENGINEERING CHANGE NOTICE NO.

05345

SHEET 1 OF 1

DWG NO. 646.9700

REV: D

PREPARED BY

J. GARDINER

DATE: 03/15/16

EFFECT ON DWG

☐ INC. ☒ UNINC.

DWG TITLE: CUTTER SUB ASSY

APPROVED BY:

ENGR.

MFG

QC

EFF.

CURRENT ORDER

TRANSACTION CODES (TC):

A-ADD
R-REVISE

C-CREATE
D-DELETE

REASON: REVISED NOTES

ECR:

N/A

ACTION ITEM:

1.

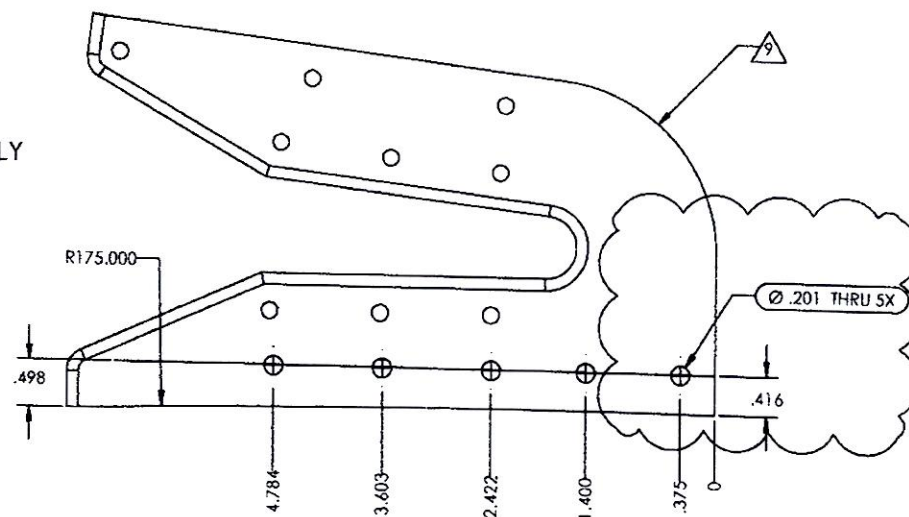
SHEET 1, ZONE A6 IS:

NOTES:

IS

- 1 MATERIAL: ALUMINUM 7075-T651 PER AMS-QQ-A-250/12
- 2 FINISH IAW MPP-172 SECTION 2.1, 3.3 & 4.3.
- 3 MATERIAL: AISI A2 TOOL STEEL
CONDITION: ANNEALED
POST PROCESS: HEAT TREAT TO 58-62 Rc ROCKWELL HARDNESS
- 4 FINISH: PRIME IAW MPP-172 SECTION 3.3; 1-2 MIL MAX
5. DEBURR AND BREAK ALL SHARP EDGES EXCEPT WHERE OTHERWISE NOTED
6. IDENTIFY IAW MPP-120
- 7 APPLY F/N 5 AS REQUIRED TO ALL FAYING SURFACES OF F/N 2 UPON ASSEMBLY
- 8 CUTTING EDGE INTENDED TO BE SHARP, DO NOT BREAK SHARP EDGE
- 9 ALL DIMENSIONS NOT SPECIFIED ARE CONTROLLED BY 646.9710.

SHEET 7, ZONE C5 IS:



DOCUMENTS EFFECTED:

☐ PATTERN ☐ MDL ☐ INSTALL INSTRUCTIONS ☐ ICA ☐ FMS ☐ BOM

CHANGE CATEGORY

☐ MAJOR ☒ MINOR

DER REVIEW REQUIRED

☐ YES ☒ NO

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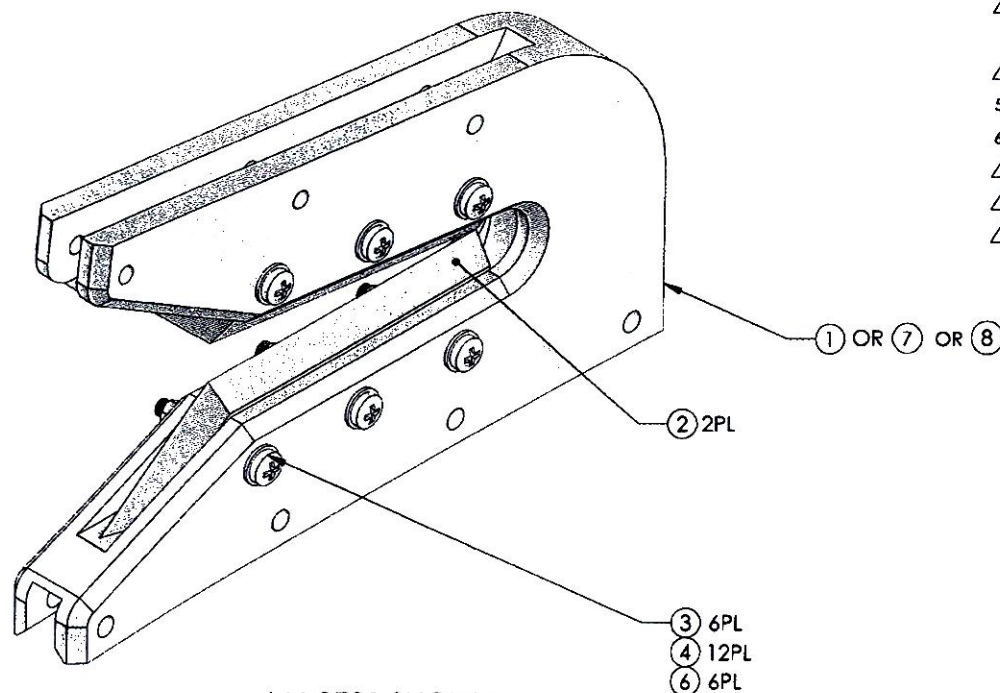
Root Cause				FAULT CATEGORY			
Environment ☐		No Re-verification ☐		Pressure/Forced ☐		Temperature/Cure ☐	
Design ☐		Operator ☐		Bending ☐		Set-up ☐	
Doc/Data ☐		Offset/Setup ☐		Centre Not Concentric ☐		BOM/Route ☐	
Equip/Tooling ☐		Supplier ☐		Cracks ☐		Broken/Damage/Defect ☐	
Handling/Pre ☐		Training ☐		Crimp/Kink/Ripple/Wave ☐		Inspection Incomplete/Unqualified ☐	
Material ☐		Use for Testing ☐		Cuffs ☐		Contamination ☐	
Internal Transport ☐		Poor Information ☐		Crushing ☐		Countersink ☐	
Tribal Knowledge ☐		Rushing ☐		Heat Treat ☐		Cut Too Short ☐	
LOA ☐		Product Improvement ☐		Wave/Twist in Tube ☐		Instructions Incomplete/Unclear ☐	
Substation ☐		Process Improvement ☐		Marks/Chatter ☐		Drill Holes ☐	
Past Expiry Date ☐		Manufacturing Process ☐		OTHER : _____			
Misidentified ☐		Past Due ☐					

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REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
	1-AS PROTOTYPE REVISION - P02		MSC
HC	NR01: RELEASE	03/29/09	P. BRAYO
A	INCORPORATED ECH 0214-0208H 03P12	04/06/09	P. BRAYO
B	INCORPORATED FCH 0216A	03/07/09	P. BRAYO
C	INCORPORATED ECH 04029	08/08/13	P. BRAYO
D	INCORPORATED ECH 04029	07/24/14	P. BRAYO

NOTES:

- 1 MATERIAL: ALUMINUM 7075-T651 PER AMS-QQ-A-250/12
- 2 FINISH IAW MPP-172 SECTION 3.3 & 4.3.
- 3 MATERIAL: AISI A2 TOOL STEEL
CONDITION: ANNEALED
POST PROCESS: HEAT TREAT TO 58-62 Rc ROCKWELL HARDNESS
- 4 FINISH: PRIME IAW MPP-172 SECTION 3.3; 1-2 MIL MAX
- 5 DEBURR AND BREAK ALL SHARP EDGES EXCEPT WHERE OTHERWISE NOTED
- 6 IDENTIFY IAW MPP-120
- 7 APPLY F/N 5 AS REQUIRED TO ALL FAYING SURFACES OF F/N 2 UPON ASSEMBLY
- 8 CUTTING EDGE INTENDED TO BE SHARP, DO NOT BREAK SHARP EDGE
- 9 ALL DIMENSIONS NOT SPECIFIED ARE CONTROLLED BY 646.97/10.



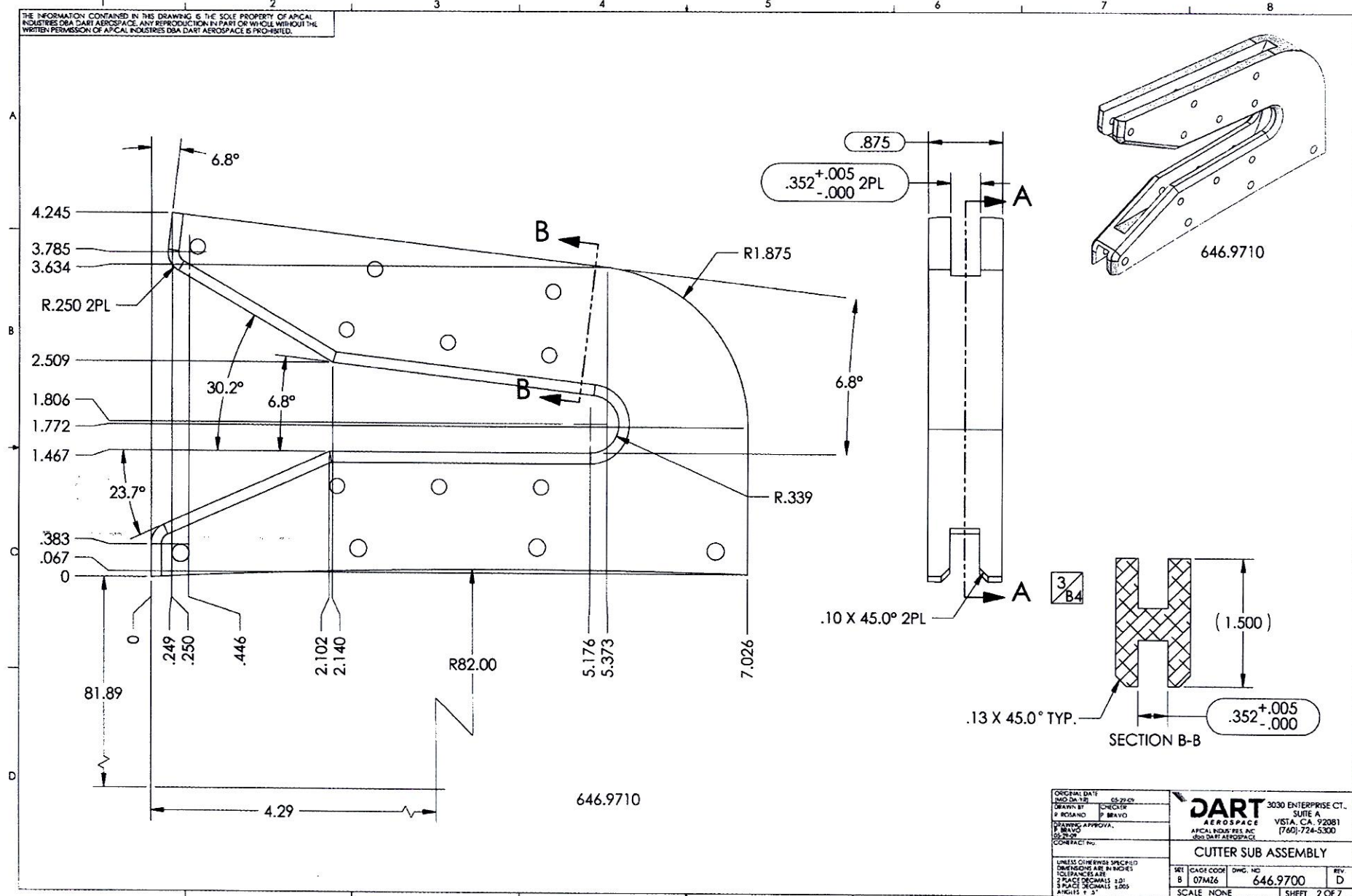
646.9701 SHOWN
646.9702 & 646.9703 TYP

UNINCORPORATED ECN(S)

05345, 05360

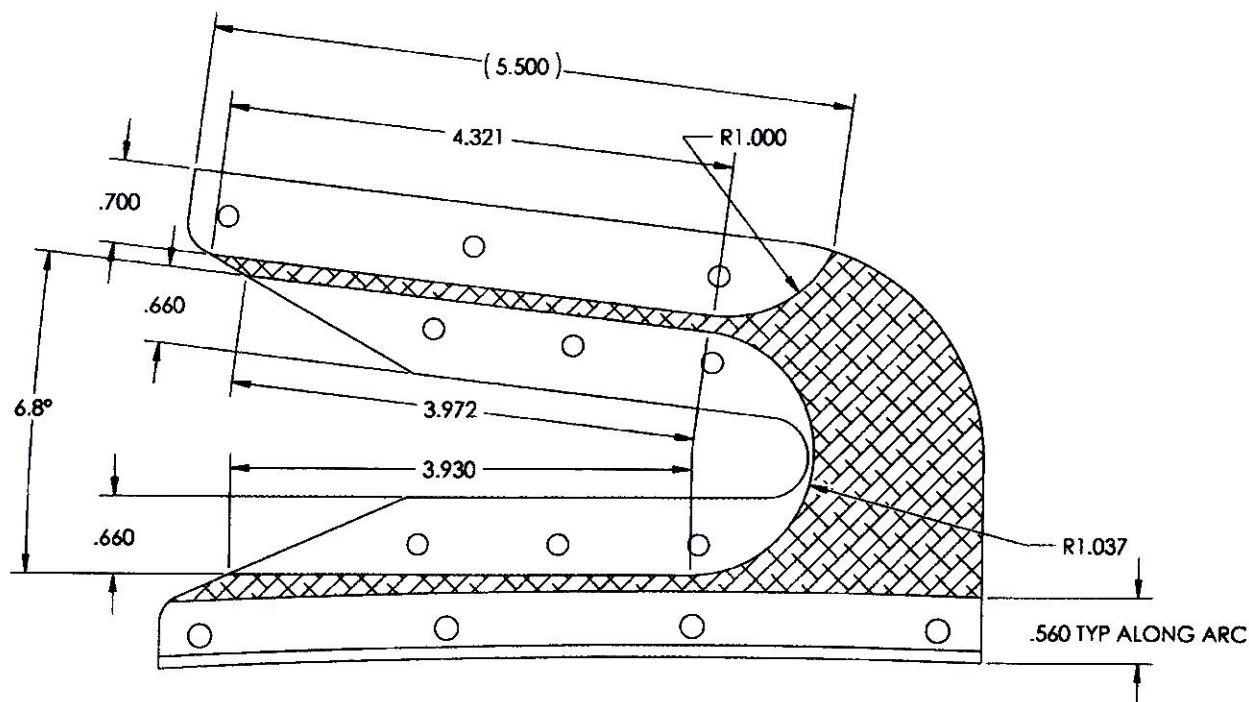
1			8	646.9713	BODY		△		△	△
	1		7	646.9712	BODY		△		△	△
6	6	6	6	601.1541	LOCKNUT					
A/R	A/R	A/R	5	601.2045	RTV, LOCTITE 598					
12	12	12	4	601.2764	WASHER					
6	6	6	3	601.2765	SCREW					
2	2	2	2	646.9711	BLADE		△			△
			1	646.9710	BODY					△
X				646.9703	CUTTER SUB ASSY					
	X			646.9702	CUTTER SUB ASSY					
		X		646.9701	CUTTER SUB ASSY					
9703	9702	9701	FIND #	PART #	DESCRIPTION		MAT'L			SPEC.
QTY				PARTS LIST						
NEXT ASSY (S)				ORIGINAL DATE DRAWN BY R. BOIANO P. BRAVO DESIGNED APPROVAL P. BRAVO CONTRACT NO. ISS. 78-08 CHITZER P. BRAVO						
646.9600				DART AEROSPACE AFCAL INDUSTRIES INC. (800) DART AEROSPACE 3030 ENTERPRISE CT. SUITE A VISTA, CA. 92081 (760)-724-5300						
				CUTTER SUB ASSEMBLY						
				SRI B CAGE CODE 07M26 QWS. NO. 646.9701 SCALE NONE 1 OF 2 REV D						
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ±.01 ANGLES ±.5° FRACTIONAL ANGLES ±.005 SHEET NO. 1 OF 2						

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ORIGINAL DATE: 05-29-02		DART AEROSPACE 3030 ENTERPRISE CT., SUITE A, VISTA, CA 92081 (760)-724-5300	
DRAWN BY: P. ROSANO	CHECKED BY: P. BRAYO	APICAL INDUSTRIES INC. DBA DART AEROSPACE	
DRAWING APPROVAL:		CUTTER SUB ASSEMBLY	
CONTRACT NO.:		SHEET: 8	OF 7
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES. TOLERANCES ARE: 2 PLACE DECIMALS ±.01; 3 PLACE DECIMALS ±.005; ANGLES ±.5°		SCALE: NONE	SHEET: 2 OF 7

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF APICAL INDUSTRIES DBA DART AEROSPACE. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF APICAL INDUSTRIES DBA DART AEROSPACE IS PROHIBITED.

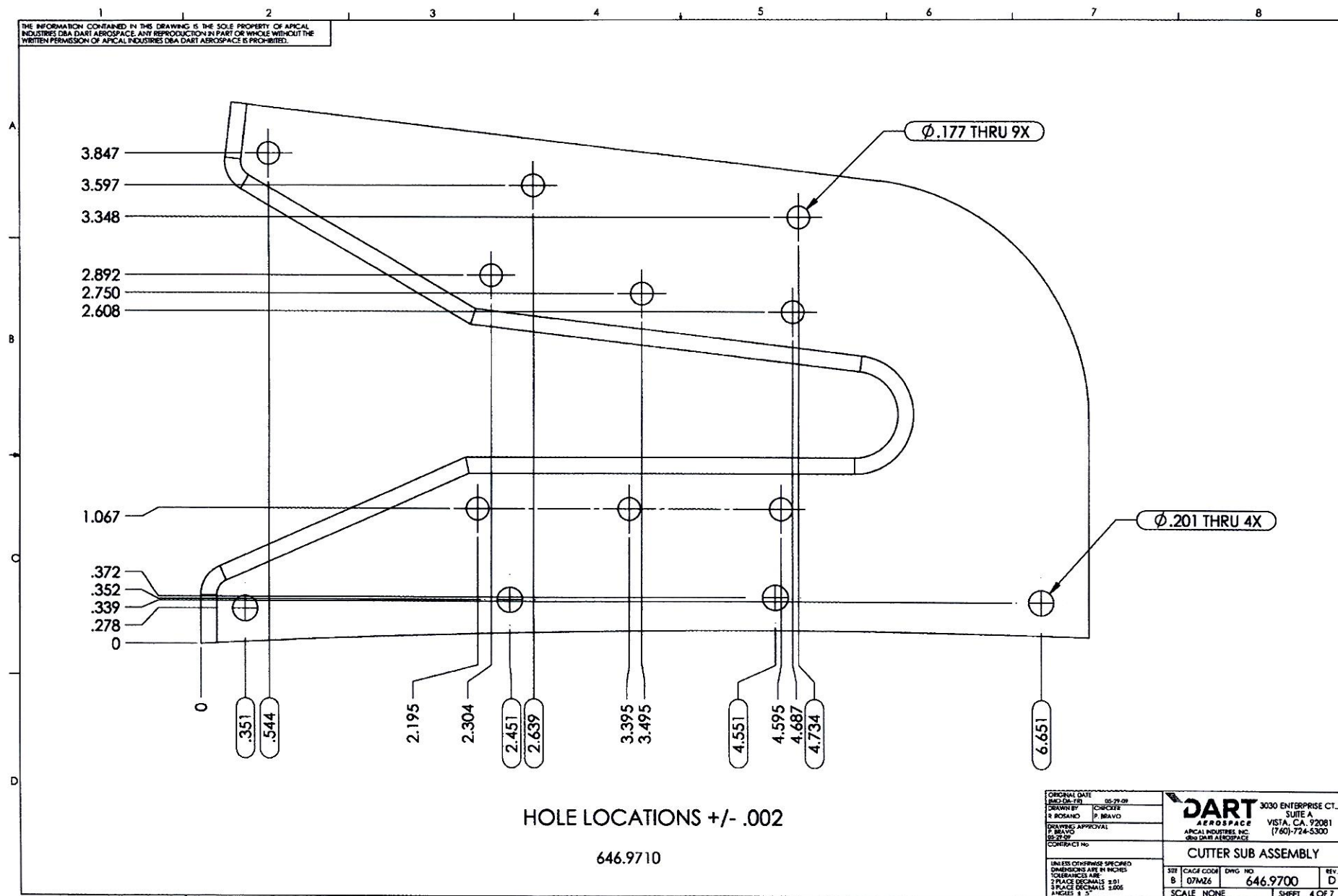


SECTION A-A $\frac{2}{C6}$

646.9710

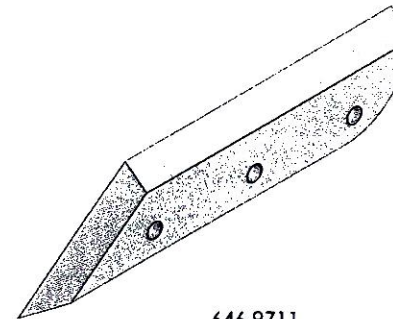
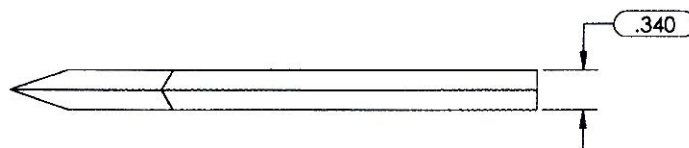
ORIGINAL DATE 10/01/00	DATE 06/29/00	DART AEROSPACE 3030 ENTERPRISE CT., SUITE A VESIA, CA. 92081 (760) 724-5300 APICAL INDUSTRIES, INC. DBA DART AEROSPACE
DRAWN BY R. BOLAND	CHECKED P. BRAVO	
ENGINEER APPROVA. D. BRAVO		
DATE 06/29/00		
C-CONTROL NO.		CUTTER SUB ASSEMBLY
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 2 PLACE DECIMALS ± .01 3 PLACE DECIMALS ± .005 ANGLES ± .5°		SET CASH CODE DWG. NO. B 07M26 646.9700 SCALE: NONE SHEET: 3 OF 7

THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF APICAL INDUSTRIES DBA DART AEROSPACE. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF APICAL INDUSTRIES DBA DART AEROSPACE IS PROHIBITED.

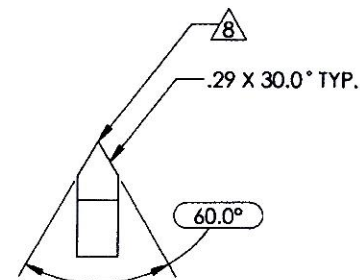
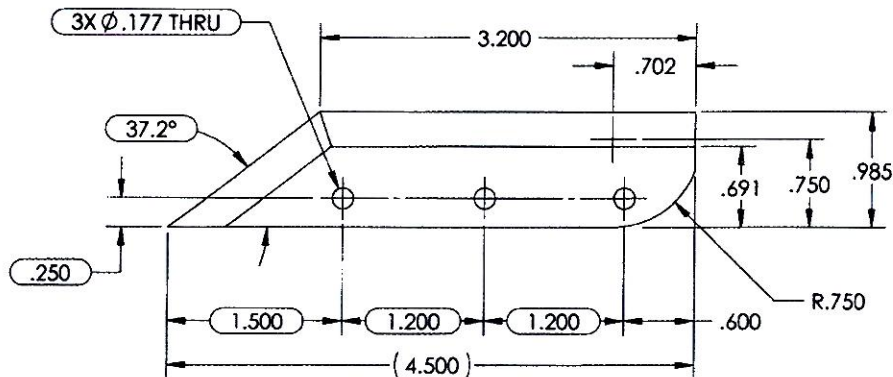


ORIGINAL DATE 05-29-09		3030 ENTERPRISE CT., SUITE A VISTA, CA. 92081 (760)-724-5300	
DRAWN BY T. ROSANO	CHECKED P. BRAVO	DART AEROSPACE	
ENGINEERING APPROVAL P. BRAVO	DATE 05-29-09	APICAL INDUSTRIES INC. DBA DART AEROSPACE	
CONTRACT NO.		CUTTER SUB ASSEMBLY	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 2 PLACE DECIMALS ±.01 3 PLACE DECIMALS ±.005 ANGLES ± 5°	SIZE B	CAGE CODE 07M26	REV D
	DWG NO. 646.9700	SCALE NONE SHEET 4 OF 7	

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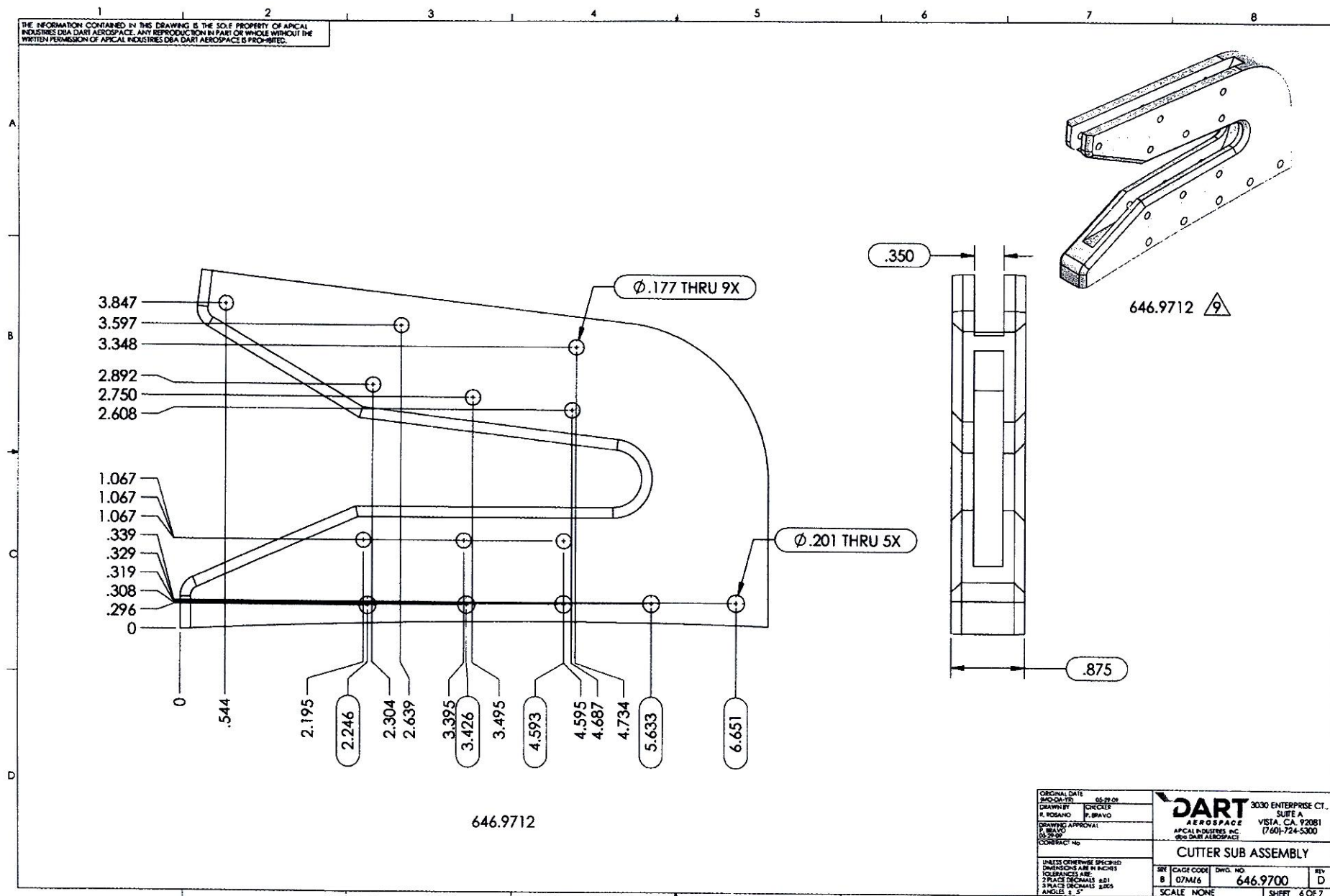
646.9711



646.9711

ORIGINAL DATE: 12-14-10		DESIGN: 03-79-01	
DRAWN BY: P. ROSSANO		CHECKED: P. BRAVO	
DRAWING APPROVAL: (Signature)		APICAL INDUSTRIES, INC. DBA DART AEROSPACE	
CONTRACT NO.		3030 ENTERPRISE CT., SUITE A, VISTA, CA, 92081 (760)-724-5300	
CUTTER SUB ASSEMBLY			
SER: B	CODE CODE: 07M26	DWG. NO.: 646.9700	REV: D
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 2 PLACE DECIMALS ±.01 3 PLACE DECIMALS ±.005 ANGLES ±.5°		SCALE: NONE SHEET: 5 OF 7	

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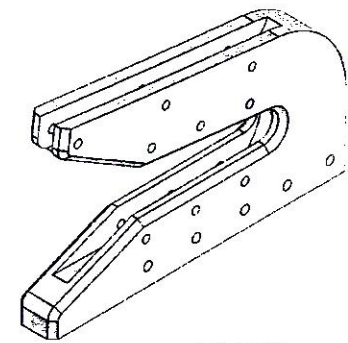


ORIGINAL DATE (M/D/Y-YY)	05-19-10	DART AEROSPACE APCAL INDUSTRIES INC. 3030 ENTERPRISE CT., SUITE A VISTA, CA 92081 (760)-724-5300		
DRAWN BY R. ROSANO	CHECKED P. BRAYO			
DRAWING APPROVAL P. BRAYO 05-29-10				
CONTRACT NO.				
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES ARE: 2 PLACES DECIMALS .001 3 PLACES DECIMALS .0005 ANGLES $\pm .5^\circ$		CUTTER SUB ASSEMBLY		
SRT	CAGE CODE		DWG. NO.	REV D
8	07MM6		646.9700	
SCALE NONE			SHEET 6 OF 7	

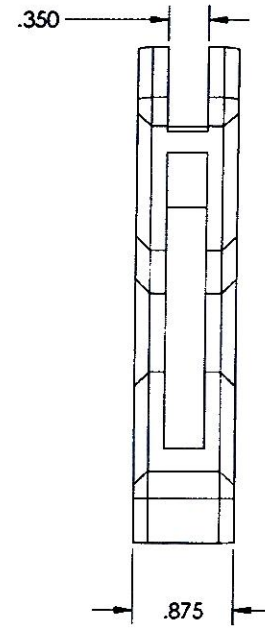
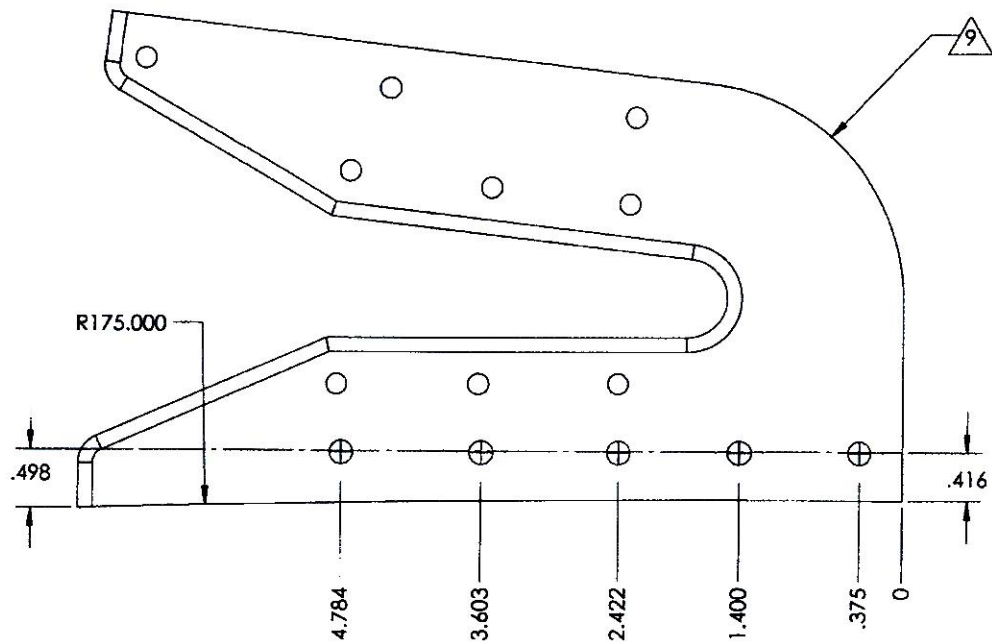
DART 3030 ENTERPRISE CT., SUITE A
VISTA, CA 92081
APICAL INDUSTRIES, INC. (760) 724-5300
DBA DART AEROSPACE

CUTTER SUB ASSEMBLY

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646.9713



ORIGINAL DATE REV. 01-19		3030 ENTERPRISE C1. SUITE A	
DRAWN BY R. ROSSANO		VISTA, CA 92081	
DRAWING APPROVAL P. BRAVO		(760) 724-5300	
CONTRACT NO.			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: 3 PLACE DECIMALS ±.01 2 PLACE DECIMALS ±.005 ANGLES ±.5°			
REV	CAGE CODE	QWG. NO.	REV
B	07MA26	646.9700	D
SCALE: NONE		SHEET 7 OF 7	